UNITED
NATIONS

UNFCCC

Framework Convention
on Climate Change

Distr.
GENERAL

FCCC/TP/2002/3
28 May 2002

ENGLISH ONLY

Technical paper

REGISTRIES UNDER THE KYOTO PROTOCOL

GE.02-61658

I. INTRODUCTION

A. Registry requirements outlined in the Marrakesh Accords

1. At its seventh session, the Conference of the Parties (COP) adopted the Marrakesh Accords, including decisions relating to the following system of registries under the Kyoto Protocol:

(a) Each Annex I Party shall establish and maintain a **national registry** to ensure the accurate accounting of the issuance, holding, transfer, acquisition, cancellation and retirement of emission reduction units (ERUs), certified emission reductions (CERs), assigned amount units (AAUs) and removal units (RMUs) and the carry-over of ERUs, CERs and AAUs, in accordance with decisic '9/CP.7 (*Modalities for the accounting of assigned amounts under the Kyoto Protocol*);

(b) The executive board shall establish and maintain a **clean development mechanism (CDM) registry** to ensure the accurate accounting of the issuance, holding, transfer and acquisition of CERs by non-Annex I Parties, in accordance with decision 17/CP.7 (*Modalities and procedures for a clean development mechanism as defined in Article 12 of the Kyoto Protocol*);

(c) The secretariat shall establish and maintain an independent **transaction log** to verify the validity of transactions, including issuance, transfer and acquisition between registries, cancellation and retirement of ERUs, CERs, AAUs and RMUs and the carry-over of ERUs, CERs and AAUs, in accordance with decision 19/CP.7 (*Modalities for the accounting of assigned amounts under Article 7.4*).

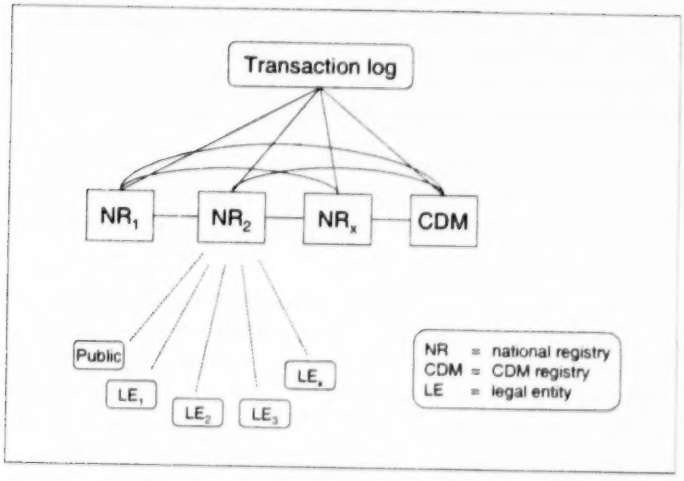
2. Each national registry and the CDM registry shall be in the form of a **standardized electronic database** which contains, *inter alia*, common data elements. Each registry is to maintain numbered accounts in which the Party and authorized legal entities hold ERUs, CERs, AAUs and/or RMUs, as well as accounts for the retirement of such units (to set them aside for compliance purposes) and the cancellation of such units (to disable their further use by the Party or legal entities). Each ERU, CER, AAU and RMU is to have a unique serial number. Each registry, in proposing a transaction, is to assign a unique number to the transaction and create a transaction record. Where appropriate, each registry is to facilitate the automated checks of the transaction log before completion of a transaction; where the transaction log notifies it of a discrepancy in the proposal, the registry is to terminate the transaction.

3. Each Annex I Party shall ensure that the total quantity of RMUs issued into its registry, and the net acquisitions of CERs from afforestation and reforestation activities under Article 12 for the first commitment period, do not exceed the limits established for that Party as set out in decision -/CMP.1 (*Land use, land-use change and forestry (LULUCF)*). Each Annex I Party shall maintain, in its national registry, a commitment period reserve consisting of holdings of ERUs, CERs, AAUs and/or RMUs for the relevant commitment period, in accordance with decision -/CMP.1 (*Modalities, rules and guidelines for emissions trading under Article 17 of the Kyoto Protocol*).

4. The structure and data formats of national registries and the CDM registry shall conform to **technical standards** to be adopted by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP) for the purpose of ensuring the accurate, transparent and efficient exchange of data between national registries, the CDM registry and the independent transaction log.

5. Figure I shows schematically the types of links that may develop for the system of registries under the Kyoto Protocol. The solid lines indicate links between individual registries and between registries and the transaction log. Such links would enable the communication of messages and instructions between registries and also facilitate the automated checks of the transaction log. Such links would quickly multiply as all Annex I Parties developed their national registries. A second level of dashed lines indicate links through which legal entities, authorized by the Party to hold units, may communicate with their national registries and through which public accessibility could be provided for.

Figure I
Links within the system of registries



B. Purpose of this technical paper

6. The COP, at its seventh session, requested the Subsidiary Body for Scientific and Technological Advice (SBSTA) to develop the technical standards for registries, with a view to recommending a decision on this matter to the COP at its eighth session, for adoption by the COP/MOP at its first session.

7. At the same session, the COP requested the Chairman of the SBSTA, with the assistance of the secretariat, to convene inter-sessional consultations with Parties and experts for the purposes of:

(a) Preparing draft technical standards, for consideration by the SBSTA at its sixteenth and seventeenth sessions;

(b) Providing for the exchange of information and experience between Annex I Parties and non-Annex I Parties as well as the secretariat, in relation to the development and establishment of national registries, the CDM registry and the transaction log.

8. Inter-sessional consultations on registries are to be held on 2-3 June 2002 in Bonn, Germany. This technical paper provides background information to these consultations. Section II contains the results of a questionnaire circulated to Annex I Parties on progress in developing their national registries. Section III discusses possible elements for the technical standards for registries.

II. NATIONAL REGISTRY DEVELOPMENT BY ANNEX I PARTIES

A. Background

9. As part of the preparation for the inter-sessional consultations on registries (2-3 June 2002), the Chairman of the SBSTA requested the secretariat to circulate a questionnaire to Annex I Parties with commitments inscribed in Annex B to the Kyoto Protocol to assess progress made and work envisaged on the development of national registries under Article 7.4 (see appendix A). Questionnaires were returned by 24 Annex I Parties. The responses may be considered as indicative at this stage as many Parties have not yet taken decisions on a number of the issues addressed in the questionnaire.

B. Results of the questionnaire on national registry development

10. Around half of the responding Parties described their activities to develop their national registries as not yet having begun and around half described them as being in preliminary planning. One Party described its activities as being in the design phase. One Party (the United Kingdom) has implemented a domestic emissions trading registry which it expects to become the Party's national registry under Article 7.4. Table I contains a summary of the results of the questionnaire.

11. Most responding Parties wish to complete the design of their national registry in 2004 or earlier and complete its construction in 2005 or earlier. Many European Union (EU) Parties, and many Parties wishing to accede to the EU, are taking account of the proposed date for the start of EU emissions trading (2005) in their consideration of this matter.

12. Parties indicated that, if they were to introduce a domestic emissions trading scheme, they would consider implementing a single registry to operate under both the domestic and the Kyoto Protocol systems. Many Parties indicated that they are considering consolidating their national registries with those of other Annex I Parties or engaging in other forms of cooperation. Most of the Parties expressing such interest are EU Parties or Parties wishing to accede to the EU.

13. Parties indicated that the responsibility for designing and constructing the national registry is likely to rest with the government. Many Parties stated that they are likely to involve consultants in this task. Most Parties expect that a government agency will maintain the national registry.

14. Among activities being undertaken or planned in developing a national registry, around half of the responding Parties indicated that they wish to consult with other Parties, including through the EU and through the inter-sessional consultations on registries under the SBSTA. The development of the technical standards was seen by many Parties as a prerequisite for their work. Many Parties indicated that they are developing national strategies on the use of the mechanisms or on how to develop a national registry. Several Parties are establishing legislation on which to base a registry. Several Parties with economies in transition wish to engage in capacity-building activities or are seeking funds to provide assistance for the development of a national registry.

15. Parties identified systems which may provide useful models or experience for the development of national registries under Article 7.4. These included, *inter alia*, central securities depositories, renewable energy certificate systems, company registers, pollutant point source registers and value added tax information exchange systems, as well as trading systems for sulphur dioxide (SO_2) emissions, nitrogen oxides (NO_x) emissions, electricity, milk and manure. Some Parties also indicated experience with systems for simulating trading in greenhouse gas emission reductions.

16. Areas identified as possibly needing the development of technical standards for registries included: Formats for serial numbers, account numbers and transaction numbers; accounting rules; data formats; communication protocols; transaction procedures; internal verification; security; data storage; public accessibility; a reference time zone; and legislative and legal issues.

Table I
Results of the questionnaire on national registry development

Annex I Party	Finish registry design	Finish registry construction	Considering a single registry if domestic trading introduced	Considering registry cooperation/consolidation with other Parties	Government operation of the national registry
Austria	2003	2004	yes	yes	maybe
Belgium		2004		yes	likely
Bulgaria	2004	2005	yes	yes	yes
Canada				unlikely	
Croatia					yes
Czech Republic	2004	2005	yes	yes	likely
Estonia					yes
European Community	2003	2004	yes	yes	yes
France	2002	2003	yes	maybe	maybe
Germany	2003/2004	2003/2004	yes	yes	yes
Japan	post COP 8	post COP 8		no	
Latvia	2003			yes	yes
Monaco		2003 [a]		yes	yes
Netherlands	2002 [b]	2002 [b]			
New Zealand	2003/2004	2005	yes	no plans	yes
Norway	2003/2004	2003/2004	yes	maybe	maybe
Poland	2003	2004 [a]	yes	yes	yes
Russian Federation	2005	2007	yes		yes
Slovakia	2003	2004	yes	yes	yes
Slovenia	2002	2003		yes	likely
Spain		2004	yes	yes	yes
Sweden		2004	likely	yes	yes
Switzerland	2003	2004	likely		yes
United Kingdom	2001	2002	likely	no plans	likely

(a) This date is dependent on the Party's use of the mechanisms.

(b) These dates refer to an interim system.

III. TECHNICAL STANDARDS FOR REGISTRIES

A. Background

17. The technical standards for registries called for by decision 19/CP.7 are to ensure that the issuance and subsequent transactions of ERUs, CERs, AAUs and RMUs occur in an accurate, transparent and efficient manner. They will also need to apply to the transaction log as it is to verify transactions.

18. The following considerations may need to be made in developing technical standards:

(a) Decisions 19/CP.7 and 17/CP.7 refer to technical standards in the context of registry aspects that are relevant to the **exchange of data**. They do not foresee that technical standards need apply to all aspects of registries. However, while some registry aspects will be *directly* relevant to the

exchange of data, other aspects may be *indirectly* relevant to such data exchange to the extent that they prevent errors occurring in data which may be subsequently sent to another registry;

(b) **Domestic policy considerations** will be important in establishing national registries. A Party which does not wish to participate in the mechanisms would still require a simple national registry with issuance and retirement functions (to demonstrate compliance with its Annex B target). Beyond this, a national registry would grow in complexity if legal entities were to participate in the mechanisms, if a domestic or regional emissions trading scheme were implemented or if a Party wished to limit the entry or exit of units from its registry. As long as a minimum set of data exchange requirements is respected, Parties may otherwise construct their registries in accordance with their individual needs;

(c) Technical standards relating to a **desired performance level** may assist Parties in adapting their registries to their individual needs; technical standards which specify, for example, the use of particular hardware or software may hinder such independent registry development;

(d) Some technical standards may need to be of a **compulsory** nature while others may only need to be **optional**. Parties may also choose to harmonize or consolidate their national registries beyond the level required by the technical standards;

(e) It may be necessary for technical standards to evolve further over time. Consideration may need to be given to how such **evolution** may take place.

B. Parallels to registries in other areas

19. While the use of registries under the Kyoto Protocol is new, databases are already in use in other fields for holding and tracking units. Shares, bonds and other securities are held in depositories. Banks maintain systems for holding currency deposits. Systems have been developed for trading certificates of electricity from renewable energy sources. Registries also exist for trading SO_2 and NO_x emissions, as well as for state-level and industry trading in greenhouse gas emission reductions. These systems may provide parallels which are useful in the development of registries under the Kyoto Protocol.

20. Moreover, some of these fields have recently seen the development of common standards to enable the transfer between parallel systems in different countries. For example, international links have been developed between securities depositories and renewable energy certificate schemes.

21. **Central securities depositories** (CSDs) are established under national law to hold securities such as equity shares and bonds. Securities are today mostly "dematerialized", so that ownership of a security is effected by an electronic record in a depository rather than by a physical certificate. When one entity sells securities to another within the same country, these transactions are "settled" by shifting the ownership record of the securities from selling accounts to buying accounts, in return for payment.

22. Standards are being developed by the European Central Depository Association (ECSDA) to facilitate the fast and secure transfer of securities ownership rights across national borders and, hence, between depositories. They aim to minimize the risks and to improve the efficiency of cross-border trades. ECSDA standards relate to legal as well as technical issues (see appendix B).

23. Standards to facilitate trading in renewable energy certificates are being developed by the industry-based **Renewable Energy Certificates Systems** group (RECS). The group has established the Association of Issuing Bodies (AIB), which has developed a basic commitment (release 1) to which all RECS schemes are to conform, and is currently finalizing a standard interface between central registration databases under each scheme (to be contained in release 2). RECS schemes have been established in 13 European countries and interest is also being shown outside Europe (see appendix B).

C. Possible elements of the technical standards

24. This section discusses possible elements of the technical standards for registries and gives information as to the types of standards that might be developed.

Number formats

25. Decisions 19/CP.7 and 17/CP.7 define three types of unique numbers, to be generated in individual registries, and the elements which each is to contain:

(a) **Serial numbers** for ERUs, CERs, AAUs and RMUs containing information on the commitment period, Party of origin, type of unit, LULUCF activity (in the case of RMUs), project identifier (in the case of ERUs and CERs) and a unique number;

(b) **Account numbers** containing information on the Party and a unique number;

(c) **Transaction numbers** containing information on the commitment period, the Party initiating the transaction and a unique number.

26. Following ISO practice, elements of these numbers may be coded as a specific number of alpha or numeric characters. Decision 19/CP.7 gives one code: The Party of origin is to be identified by the two-letter country code defined by ISO 3166 (for example, FR for France). The Party code is therefore to consist of two capitalized alpha characters (or "2A"). A code consisting of two numeric characters ("2n") for the commitment period would allow referencing of up to 99 commitment periods. A code consisting of four alphanumeric characters ("4An") for a Party's project identifiers, through allowing combinations of letter and numbers, would allow over 1.5 million projects to be uniquely identified.

27. All such elements could be contained in one field (for example, 2n2A1n1n12n4An for serial numbers) or in individual fields. The latter case would create more flexibility by allowing registries to manage the fields in different ways. A standard field sequence would, however, be required for communicating numbers to other registries or to the transaction log. Parties would also be able to define other fields for internal purposes, though these may not need to be included in communications between registries. International standards, such as for securities, are moving towards using individual fields.

28. Further considerations may be relevant to number formats. Alpha characters may increase the human readability of numbers but would require the choice of a specific set of language characters. Numeric codes could be managed by computers, which could also interpret the code so that registry operators and users would rarely need to look at the numbers themselves (for example, look-up tables).

29. Other standardized numbering systems could also be considered, such as Universal Product Codes (UPC), European Article Numbers (EAN) or International Bank Account Numbers (IBAN).

Message exchange procedures

30. Decision 19/CP.7 defines a sequence of notifications to be communicated between registries, and between registries and the transaction log, in the course of transactions. These notifications serve to manage the transaction procedure and facilitate the automated checks of the transaction log.

31. Figure II uses solid arrows to show the exchange of messages, as specified in decision 19/CP.7, during a transfer of units from an account in one registry to an account in another registry:

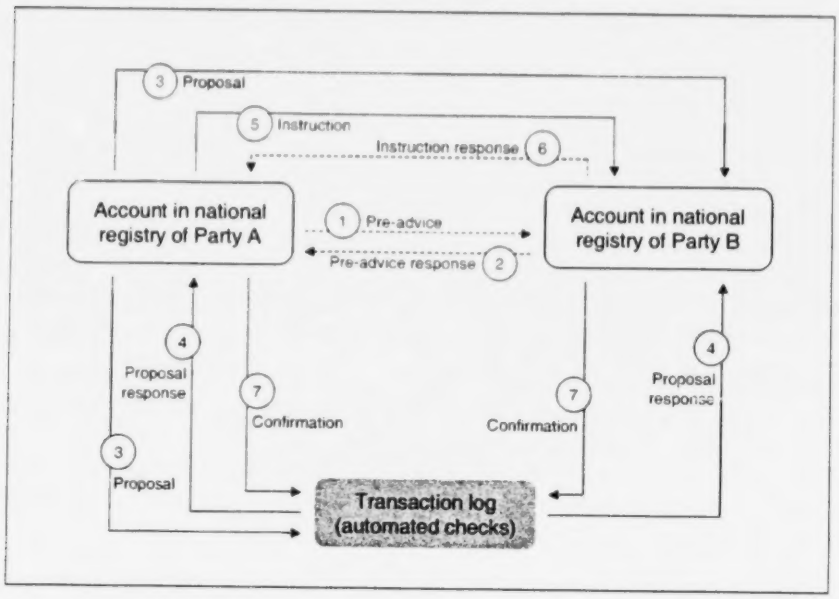
(a) The registry of Party A (this could equally be the CDM registry), in proposing the transaction, creates a unique transaction number and transaction record and sends a **proposal** message to the other registry and the transaction log (message 3 in figure II);

(b) The transaction log conducts its automated checks of the proposed transaction and sends a **response to the proposal** to each registry indicating the results of the checks (message 4);

(c) If no discrepancy was found by the transaction log, the initiating registry may remove the units from the relevant account and sends an **instruction** to the acquiring registry to add the units to its relevant account (message 5). If a discrepancy was found by the transaction log, the instruction message could signal that the transaction procedures in the acquiring registry should be terminated;

(d) Each registry sends a **confirmation** message to the transaction log (message 7), indicating whether the transaction has been completed or terminated, to enable it to update its records.

Figure II
Possible message exchange: international transfer

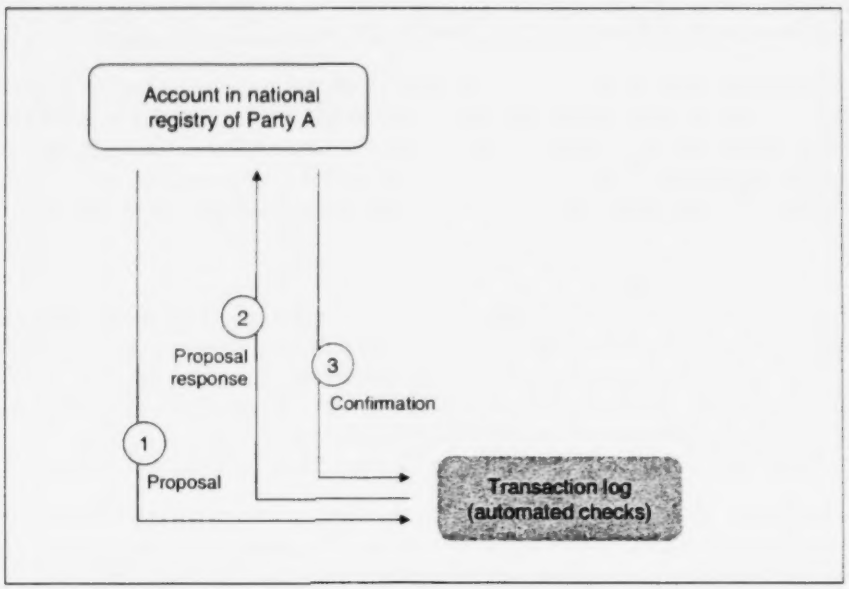


32. The dashed lines in figure II indicate other messages which may be useful to consider but which are not specified in decision 19/CP.7. A **pre-advice** (message 1), and a **response to the pre-advice** (message 2), would allow the acquiring registry to accept or decline the transfer in principle, prior to the formal proposal being made and the automated checks of the transaction log being initiated. A **response to the instruction** (message 6) may be useful in allowing the two registries to ensure their own coordination before confirming the completion or termination of the transaction to the transaction log. This list is by no means exhaustive and the necessity for further messages may need to be considered.

33. Further considerations may be important in the message exchange procedures. Once a proposal has been made to transfer units, it may be necessary to block their transfer by a second transaction until the first transaction has had sufficient time to be completed. Registries and/or the transaction log may need to place transactions in a queue. Procedures for dealing with failed transactions may be required. Perhaps transactions that fail due to an infringement of the commitment period reserve could be made pending until the proposed transaction can take place without the reserve being violated. Alternatively, only part of the transaction could be carried out so that the commitment period reserve is not infringed upon. Transactions may be processed in real time or may be batched together for processing at intervals.

34. Figure III shows the message exchange for transactions within a national registry or the CDM registry which, in accordance with decision 19/CP.7, are to be subject to the transaction log checks. Such checks are to be applied to the internal issuance, cancellation and retirement of ERUs, CERs, AAUs and RMUs and the carry-over of ERUs, CERs and AAUs. They are not to apply to transfers and acquisitions between accounts in a single registry, other than transfers to a cancellation or retirement account. This message exchange is as follows: A proposal, a response by the transaction log and, after the completion or termination of the transaction within the registry, a confirmation to the transaction log.

Figure III
Possible message exchange: Issuance, cancellation, retirement and carry-over



Message content and communication protocols

35. The content of messages exchanged between registries, or between registries and the transaction log, also needs to be considered. Possible content includes:

(a) The **transaction number** which, in accordance with decision 19/CP.7, is generated by the registry initiating the transaction. This transaction identification could be included in all messages;

(b) The **transaction record** which, also in accordance with decision 19/CP.7, contains the transaction type (an international transfer in the figure II example), the serial numbers of the relevant units and the relevant account numbers (the transferring and acquiring accounts in the figure II example). Including the transaction record in a pre-advice (message 1) and the proposal (message 3) may be sufficient as these would link it uniquely with a specific transaction number;

(c) The **status** of the transaction may also be necessary in some of the messages. For example, the response to the proposal from the transaction log (message 4) could indicate "approved" or "rejected"; the instruction (message 5) could indicate "continue" or "cancel"; and the confirmation (message 7) could indicate "completed" or "terminated";

(d) **Other information** could also be included in the content of messages. For example, in a case where a "rejected" status is sent, the response to the proposal (message 4) could indicate a reason.

36. The format of messages will depend on the particular communications protocol chosen. Hypertext Markup Language (**HTML**) is currently the main Internet language and enables text information to be assigned a specified and limited set of tags containing instructions on what to do with the text. Extensible Markup Language (**XML**) also allows text information to be tagged, but is far more flexible in that the tags can be used to describe the information and may be defined by the users themselves (for example, information can be specified as a unit name or quantity). As a result, the information can be more readily recognized by the people and the systems needing to use it. Messages used widely in the banking and finance industries, as defined by ISO and supported by the Society for Worldwide Interbank Financial Telecommunication (**SWIFT**), are structured text messages.

37. Standardizing message formats would avoid the need to translate them before they are read by a registry. For example, it would be possible for a registry to operate its links with legal entities (the lower part of figure I) with different messaging formats from its links with other registries (the upper part of figure I). This would make it necessary, however, for the registry to translate messages from entities before passing them onwards. Operating a standard message format on all links would be more efficient.

Security standards

38. Registry and transaction log security is required to prevent the **unauthorized manipulation of data** and to **authenticate the sender of electronic messages**. Such security can be established through implementing a firewall to manage access to a system and through the use of protocols such as Secure Sockets Layers (SSL) to establish a secure connection between servers. SSL works by using a key to encrypt data for transmission across the secure connection. Messages can be authenticated by establishing "digital certificates" for the transmitting server (or for the user initiating the transmission).

39. Various levels of encryption are currently in use. For example, a 128 bit key is currently used by many Internet sites (such as in obtaining credit card numbers), the SO_2 emissions trading registry in the United States and the domestic emissions trading registry in the United Kingdom. A 512 bit key is standard for financial transfers across the SWIFT network and 1024 bit keys are used by some securities depositories. Keys consisting of a higher number of bits are more complex and are therefore more difficult to decode. In order to ensure security, encryption keys need to be changed at regular intervals.

40. The choice of encryption level would need to take account of the level available as new software develops and the level necessary as older software becomes more susceptible to decoding. From a legal perspective, account may need to be taken of levels of encryption recognized by the relevant courts as providing a degree of authentication or non-repudiation that is equivalent to a written signature.

Internal verification procedures

41. Internal verification procedures may be relevant to technical standards to the extent that they prevent errors occurring in data, in particular those which may affect the integrity of other registries. It may be necessary to ensure the validity of a sender when a message is received. It may also be necessary to implement measures to avoid infringements of the commitment period reserve or limits on the issuance and use of RMUs and CERs from afforestation and reforestation project activities under the CDM.

User interfaces

42. Various interfaces may be established to give external access to the registry. The public is to have access to information on the registry through the Internet, in accordance with decision 19/CP.7, and

legal entities participating in the mechanisms or in domestic emissions trading would most likely be given electronic access to their accounts. It may also be necessary for access to a registry to be provided to other registries and the transaction log. Standardizing elements of such interfaces, or setting minimum accessibility standards, may improve the transparency of registries and could help to overcome communication difficulties where different languages are used by Parties.

Data storage

43. Serial numbers of consecutive units could be stored in registries in blocks, such that one entry in the registry database shows the beginning and last unique numeric code of serial numbers in the block (where all other elements are identical). Such blocks could be split by subsequent transactions. This may simplify data storage and communication.

44. Other aspects of data storage may also need to be considered in the context of technical standards. For example, further elaboration may be required of the information to be made publicly accessible in accordance with paragraphs 44 to 48 of decision 19/CP.7. The length of time that data should be retained within a registry, or should be maintained as publicly accessible, may need consideration. The use of accounting conventions may also need consideration.

Other possible elements of technical standards

45. It may also be necessary to consider other aspects of registries. These could, for example, relate to standards to be met by **registry administrators**. Aspects of the **institutional and legal framework** pertaining to a registry may also be relevant. In particular, legal consideration may need to be given to:

(a) At what point a unit being transferred between registries moves from the legal jurisdiction of one Party to that of the other;

(b) The definition and recognition of units in a registry (especially if units other than ERUs, CERs, AAUs and RMUs are established under domestic or regional emission trading schemes);

(c) Dispute resolution procedures;

(d) The legal status of the transaction log (especially in relation to liability and final authority in cases of discrepancies between records held by the transaction log and registries).

APPENDIX A

Questionnaire sent to Annex I Parties on their national registry development

1. Please indicate the stage of development of your Party's national registry under Article 7.4: Work has not yet begun; preliminary planning; design of national registry/technical specification; construction/testing.

2. If possible, please give an approximate estimate of when the design and construction phases of the national registry under Article 7.4 are expected to be completed.

3. What activities is your Party undertaking, or planning to undertake, in designing and constructing its national registry under Article 7.4?

4. Please describe any existing software or computer platforms being considered for the national registry under Article 7.4? Alternatively, please indicate any types of software or platform being considered or developed as the possible base for the national registry?

5. In the course of work so far, which areas appear to require the development of technical standards for application in the national registries under Article 7.4 of all Annex I Parties?

6. If your Party intends to implement a domestic emissions trading scheme, or be involved in a regional scheme, would your Party's national registry under Article 7.4 also perform as the registry at the domestic or regional level? If not, how might the national registry under Article 7.4 be related or linked to a registry for a domestic or regional scheme?

7. Please describe briefly any work undertaken to develop a registry for a domestic or regional emissions trading scheme (where this differs from the national registry under Article 7.4).

8. What other registry systems, or their equivalents, exist in your Party which may provide useful models or experience for the development of the national registry under Article 7.4?

9. What information concerning the development of the national registry under Article 7.4, or other registry systems, is your Party able to share with other Parties? Please attach such information when returning this questionnaire (or send separately).

10. Which agency or institution is undertaking, or will be undertaking, the design and construction of the national registry under Article 7.4? To what extent are commercial contractors to be involved?

11. Is the national registry under Article 7.4 likely to be operated by a government agency?

12. Is your Party considering the consolidation of its national registry under Article 7.4 with those of other Parties? Are other specific forms of cooperation with other Parties foreseen?

13. If possible, please indicate expected personnel and financial resources needed for the design, construction and operation of the national registry under Article 7.4?

14. Please indicate the government contact on the development of your Party's national registry under Article 7.4.

15. Please indicate other contacts, inside or outside government, who could provide expertise in developing national registries under Article 7.4, the CDM registry or the transaction log.

APPENDIX B

Parallels to registries in other areas

European Central Securities Depositories Association (ECSDA) (see www.ecsda.com)

1. ECSDA was established in 1997 and comprises national and international CSDs in the EU, Norway and Switzerland. Its main objective is to develop links between its members to enable fast and secure securities settlement in Europe. Standards are developed on the basis of consensus and are implemented voluntarily. ECSDA currently has four working groups considering the following topics:

(a) Legal aspects of links between ECSDA members. This group has developed model agreements between European CSDs and on the subject of cross-border settlement;

(b) Cross-border clearing and settlement. This group has developed a standard model relating to, *inter alia*, settlement finality (the point at which the change of ownership is unconditional and irrevocable), real-time settlement, release instructions, order routing and reconciliation;

(c) Technical aspects of links between ECSDA members. This group has determined the technical infrastructure needed to implement electronic links between CSDs, including message sequences and formats. The group agreed on the ISO 15022 standard messages developed by the Society for Worldwide Interbank Financial Communication (SWIFT). The work of this group has made a significant contribution to global market practices in this area;

(d) Corporate actions processing. This group is developing standards for handling the cross-border processing of corporate actions and events such as dividends, interest payments and rights issues.

2. Systems for securities settlement are to be distinguished from share or bond exchanges (where the decisions to trade are negotiated) and the banking system (where payment is made for the traded securities). However, these systems are becoming increasingly integrated: settlement finality is dependent on payment being received by the seller and settlement increasingly occurs in real time, immediately after a transaction between two entities has been agreed.

3. There are, however, important differences between securities depositories and the registries under the Kyoto Protocol. Because of the need to service securities in their home country (in the case of dividend or interest payments, for example), it is the ownership rights of the securities which are transferred abroad rather than the securities themselves. Also, securities today typically do not have individual serial numbers. Rather, the International Security Identification Numbers (ISINs) used to identify securities are unique to a particular set of securities with the same characteristics (issuer, maturity, interest rate, etc).

Renewable Energy Certificate Systems (RECS)[1]

4. The RECS group is comprised mainly of electricity industry companies but also involves government representatives. It aims to demonstrate the viability of incorporating international trading of renewable energy certificates in future renewable energy policy. The basic commitment (release 1), developed by the Association of Issuing Bodies (AIB), is to be applied in all participating schemes. It outlines a minimum set of common definitions and criteria for the creation, issue, transfer and use of certificates. The standard interface being developed to connect central registry databases in different schemes recently facilitated the first international trading of RECS certificates.

- - - - -

[1] see www.recs.org